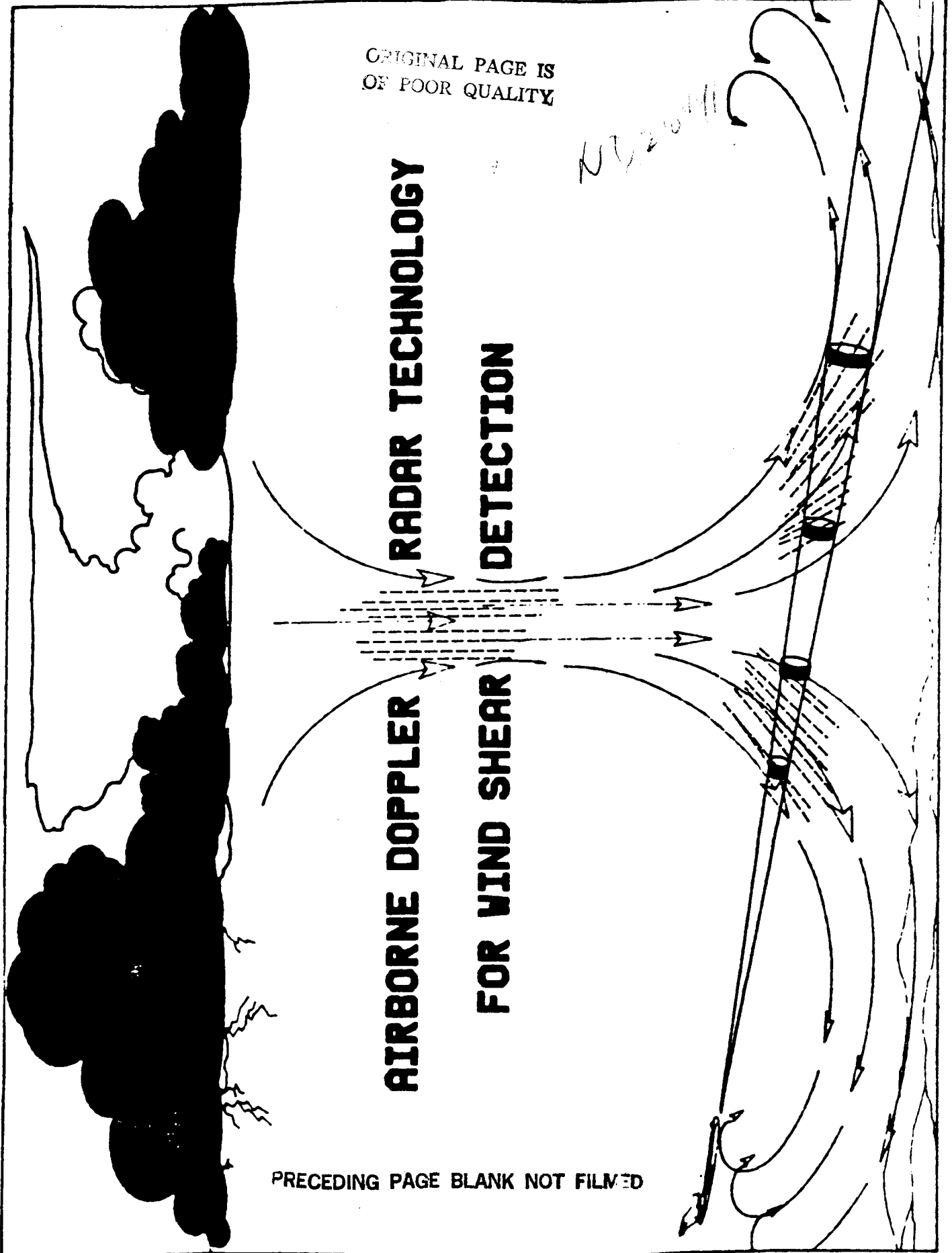


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**RADAR TECHNOLOGY
DETECTION
AIRBORNE DOPPLER
FOR WIND SHEAR**

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OBJECTIVES OF THE AIRBORNE DOPPLER RADAR TECHNOLOGY DEVELOPMENT PROGRAM

- Quantify Physical Influences and Required Performance Bounds for Useful Airborne Doppler Radar Detection of Low Altitude Wind Shear.
- Develop Analysis Tools Which Can Provide a Basis for the Evaluation and Analysis of Prototype Airborne Radar Designs that can lead to Eventual Certification.
- Design/Procure Appropriate Experimental Hardware and Structure an Experimental Flight Program with wide Government/Industry Support to Evaluate and Verify Airborne Detection and Measurement Techniques.

TECHNICAL APPROACH

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● SIMULATION AND ANALYTICAL STUDIES

- Develop Atmos./Clutter/Airborne Radar Simulation Computer Programs.
- Conduct Parametric Trade-Off Studies
- Generate Simulated Time Series Radar Data For Industry Applications
- Evaluate Candidate Radar Concepts

● CLUTTER MODELING AND ANALYSIS

- Generate Clutter Backscatter Maps for use in the Radar Simulation Program
- Obtain Actual Synthetic Aperture Radar (SAR) Clutter Data for use in the Backscatter Maps
- Using the SAR Clutter Map Data Conduct Studies to Determine the Effects of Clutter on the Performance of Radar Concepts
- Adapt and Apply Theoretical Clutter Simulation Models to Aid in Understanding the Full Clutter Environment

● DATA COLLECTION AND FLIGHT EXPERIMENTATION

- Collect and Analyze Ground Based Radar Windshear Data
- Develop an Airborne Radar Scatterometer Instrument
- Conduct Flight Experiments to Collect Airport Clutter Data and Windshear Data From Convective Storms. Use Data to Evaluate and Up-Grade the Atmos./Clutter/Airborne Radar Simulation Program.

STATUS

- INITIAL VERSION OF ATMOS./CLUTTER/AIRBORNE SIMULATION PROGRAM DEVELOPED
 - New Microburst Windfield & Clutter Map
 - Simulates Various Radar Characteristics
 - Incorporates Various Processing Techniques
 - Computes Various Radar Parameters
- VARIOUS DOPPLER RADAR SIGNAL/CLUTTER SPECTRUM ANALYSIS PERFORMED
- CONTRACT AWARDED TO ENVIRONMENTAL RESEARCH INSTITUTE OF MICH. (ERIM) FOR CLUTTER DATA
 - Survey Inventory of Existing SAR Data
 - Analyze & Process SAR Data & Provide Digital Images & Tapes of Backscatter Data
 - Conduct Ground & Flight Clutter Data Collection Using SAR
- NORTHEASTERN UNIV. GRANT UNDERWAY
 - Develop Theoretical Doppler Radar Clutter Simulation Program
 - Conduct Clutter Simulation Studies During Take-Off & Landing
- PRELIMINARY DESIGN OF EXPERIMENTAL RADAR SCATTEROMETER

AIRBORNE WINDSHEAR RADAR TECHNOLOGY PROGRAM

